

STUDY OF COMPUTER SOFTWARE INDUSTRY IN INDIA

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by

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to the

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FEBRUARY, 1994.**

CERTIFICATE

It is certified that the work contained in the thesis entitled "A STUDY OF COMPUTER SOFTWARE INDUSTRY IN INDIA." by Mr. Rajesh Kumar Sharma has been carried out under my supervision. [and that this work has not been submitted elsewhere for a degree.]

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ABSTRACT

This study analyses various aspects of Software Industry in India and links some operating features of Software firms to Sales, Exports etc. For this purpose a questionnaire was designed and a survey of Software firms operating in India was conducted. Filled up questionnaires were received from 14 Software firms.

The study shows that Software Industry is an emerging industry and has a fragmented structure. Government incentives influence in selection of location for software development facility in India. The demand potential of software services in a territory plays a crucial role in selection of a location for an overseas representative office. Use of datacommunication satellite link helps in increasing Off Share sales. The most effective means of promotion followed by firms is through Personal contacts. Exports have a high percentage of customised application software sales. Internal growth is the most preferred means of achieving growth .Software firms give high emphasis on focussing in particular application areas.

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CHAPTER 1

INTRODUCTION

This study is about operational aspects of the Software industry in India. It also attempts to link the performance of the firms in the software industry to these operational aspects. In this exploratory work we have analysed some of the important aspects and their effect on the firms growth, innovativeness, business strategy and other competitive forces which form an integral part of this industry.

Computers - a marvel of science have found their way into every aspect of not only business but also in the life of common man. Computer is considered as one of the most complex machines ever designed by man. This complexity of the computer produced a crucial characteristic of computer industry; it virtually ensured that computer makers would opt for vertical integration i.e. to make most of the parts of machine themselves, with the software to run them. Thus, until the eighties the global computer business was dominated by vertically integrated companies, that made every element of computer, from chips to software. Microprocessors, always a more affordable source of processing power than mainframes, have finally caught up with the larger machines in computing power. As a result the technology used in most of the earlier mainframes and minicomputers is becoming obsolete; with it old business models. Most new hardware and software is now designed to work with other computer companies' products. As a result, a large number of suppliers have leaped into this booming industry to do battle over each segment, from Chips to Application Software, from disk drives to networking programs. It was the launch of the first personal computer (popularly known as PC) in 1981 by IBM that changed the dynamics of this industry and lead to the mushrooming of small software companies which began writing application programs for

personal computers.

In India with the setting of Dept. of Electronics in 1973, the seed of computer industry was sown. The phase from 1973 to 1982 was an infancy phase during which electronics just began to emerge as an efficient technology in business and manufacturing industry. With the policies of the government in mid 80's, relaxed norms for importing computers , ultimately led to proliferation of computers in business and subsequently setting up of computer assembling and software firms in India. At the same time thrust on exports by government of India and incentives to exporters lead to indian entrepreneurs setting business in those industry which enjoyed certain comparative advantages as compared to their counterparts in other countries because of labour factor conditions in India. With lower labour cost as compared to those prevailing in western countries ,labour intensive industries like Software, textiles, construction began to increase their presence by exporting services and finished products to foreign countries.

1.1 WORLD SOFTWARE INDUSTRY:

World software market has grown tremendously over the last one decade. The market which was worth US\$27 billion in 1981 stood at US\$54.8 billion in 1985 ,US\$110 billion in 1988 and US\$162 billion in 1991- a compound growth rate of 12% over the last ten years. It is projected to grow well over US\$340 billion by 1996. By the turn of the century information technology is slated to be the largest industry in the world ,with the market of software increasing twice as much as that of hardware.

CHAPTER 2

INDIA SOFTWARE SCENARIO

The growth of software industry in India is closely associated with growth of the computer industry itself. Unlike most developed markets, the hardware is currently larger than software market.

In developed countries, expenditure on computers (hardware and software both) is currently between 3% and 5% of GNP, while in India it is only 0.25% of GNP and is expected to touch 1% by the turn of the century. Despite India's potential for world leadership in computer software the country's share in the global market has shown a decline. Between 1990 and 1991 it slipped albeit marginally, from 11.9% to 11.7% of the global "foreign opportunity"(inter country trade) in software. According to a 1992 World Bank sponsored study India's software exports are likely to reach a level of US\$660 million by 1996 if historic annual compound growth rate of 32% is maintained. At this level India's share in "foreign opportunity" will have decreased to 9%(Bidwai.P,1993). The total software exports from India as a worldwide software output (around US\$40 billion) is a meagre 0.02%. Other third world countries which compete with India and have much larger shares, include China, Taiwan and Hungary. Presently software firm in India have export productivity of about US\$25,000 per employee per year which is lower than those in Singapore, Hungary, Israel and Mexico. Ireland which currently holds the global number one position in software exports has productivity of US\$ 45,000 per employee per year. India's standing in the customised application packaged software is currently fifth even below that of Israel and Mexico, and the overall preference rating for India is at number three which is

below that of Ireland and Israel.

Indian software firms are presently engaged in both domestic and export markets. According to report published by NASSCOM (National Association of Software and Service Companies) at present there are about 330 firms catering to domestic market and 250 firms catering to export sector. There are many other public and private sector companies which develop software for inhouse purposes.

2.1 Software Industry in Domestic Market:

This industry which was worth Rs.900 million in 86-87 has earned revenues of Rs.4900 million in 92-93 showing a compound annual growth rate of 32.6%. Domestic companies employ about 25000 technical people. There are 51 companies employing 50 or more software professionals. The structure of software industry for the domestic market is a mixture of few large companies and a plethora of small and medium sized companies. At present there are 190 firms which have number of employees less than 20 and 28 firms have total number of employees exceeding 100. For the year 92-93 top fifteen players accounted 37.3% of total domestic revenues and the leading firm had a market share of approximately 9%. This indicates that the domestic software industry is highly fragmented. Average revenue per employee is around Rs.2 lakhs. Of the total revenue of Rs.4900 million in 92-93 turnkey projects accounted for 44% and products and packages 36%. The products and packages segment includes sale of imported packages.

2.2 Software Export Industry :

Indian Software export industry is one of the fastest growing export sectors of Indian industry. In terms of Indian currency the compound annual growth rate (CAGR) has been 54.3% and in terms of US dollars it has been 34% since 1985. Indian

software firms exported software worth US \$24 million (Rs.288 million) in 1985 and by year 92-93 exports were worth US\$225 million (Rs.6750 million). As compared to this global software industry showed a CAGR of 15% during this period. The industry has been steadily expanding into different application areas as diverse as manufacturing planning to education to security. Software exporting companies in India employ about 9850 technical people. More than 45 companies have over 50 software professionals on their pay rolls. For 92-93 top fifteen players accounted for 63.5% of the total exports and the leader accounted for 22% of the total exports. As compared to domestic software industry for domestic market industry for export is more concentrated. In 92-93 13 companies exported software worth Rs.100 million or more. Out of these 13 firms, 8 firms are subsidiaries of global companies. Of late software exports are showing a perceptible shift towards Off shore development (A software development process in which software developing firms write codes at their own site instead of deputing their software professionals to their client site). The percentage of On site development in software exports has decreased from 90% in 1988 to 59% in 92-93 and the future will show further decrease because of stringent visa regulations in the client country and low cost incurred in off shore development. In 92-93 Indian firms exported almost 58% of their total software exports and Europe accounted for 18%. The six OECD countries (U.S.A., Japan, U.K., Germany, France and Italy) together account for 78% of the worldwide software market.

TABLE 2.1:

INDIA'S TURNOVER IN SOFTWARE AND HARDWARE
(1985-86 TO 1992-93)

YEAR	SOFTWARE (Rs. crores)	HARDWARE (RS. crores)
1985-86	98	190
1986-87	140	258
1987-88	175	357
1988-89	241	510
1989-90	345	966
1990-91	471	971
1991-92	750	1024
1992-93	1165	1255

TABLE 2.2:

SOFTWARE REVENUES - EXPORT AND DOMESTIC
(1985-86 TO 1992-93)

YEAR	EXPORTS (Rs. crores)	DOMESTIC (Rs. crores)
1985-86	38	60
1986-87	50	90
1987-88	70	105
1988-89	101	140
1989-90	175	170
1990-91	250	225
1991-92	430	320
1992-93	675	490

2.3 GOVERNMENT POLICY:

Government plays an important role in the way business is carried in an industry. While the role of government in creating and sustaining national advantage is significant, however, it is only a limited role. Governments do not control national advantage, they can only influence it. The central goal of government policy toward the economy is to deploy a nation's resources (labour and capital) with high and rising levels of productivity. Rising to the need of hour Indian government has announced far reaching changes in the government policy. The changes made in the government policy in last couple of years had significant impact on Indian Computer industry. In this connection one needs to consider three issues : trade policy, industrial policy and the budget.

The new five year Export-Import policy announced substantially eliminated licensing, quantitative restrictions and other regulatory and discretionary controls. It streamlined the duty structures and import rules by introducing a slimmer negative list of imports, liberalized imports of capital goods against export obligations and offered incentives for 100% EOU's and those located in Export processing zones. The policy allows the import of computer systems for software exports at concessional rates of customs duty , against a specific import license depending on export obligations. The details of customs duties effective from March'92 are as mentioned in Table 2.3. The reduction in custom duties provided significant incentives to software firms engaged in software exports.

TABLE 2.3:

Custom duties effective from 1 March 1992.

	BASIC %	AUXILIARY %	ADDITIONAL %	TOTAL %
COMPUTER SYSTEMS				
Computer systems	30	45	17.25	92.25
Photo typesetting and composing machines	35	5	Nil	40
For R&D units	Nil	Nil	Nil	Nil
For software exports				
a) General				
b) EXIM	5	30	Nil	35
c) 350% export commitment	5	30	Nil	35
d) For startup spares	25	Nil	Nil	25
e) Application software	Nil	Nil	Nil	Nil
Software				
a) Source code on paper	Nil	45	Nil	45
b) Others	65	45	Nil	110

In case of Industrial Policy the changes which were of importance to software industry were- import of capital goods upto Rs 20 million, Foreign equity of 51% for software services firm, goods could be imported freely with FOREX at market rate. Tax benefits included were - 80 HHE: profits for software or service exports are tax exempt, 50% of consultancy is tax exempt, 50% of royalties, commision , fees are tax exempt, double taxation avoidance agrreements exist with 45 countries.

Since maximum number of software units are set under Export Processing zone (EPZ), Export oriented unit (EOU) and Software Technology Park (STP) schemes hence it is important here to discuss the issues pertaining to them.

2.3.1 Export Processing Zones(EPZ) :

Export processing zones are enclaves separated from Domestic tariff area (DTA) where export production is organised on an internationally competitive basis with requisite infrastructure and duty free imports. These zones are located at Kandla(Gujarat), Santacruz(Maharastra), NOIDA(U.P), Madras(Tamil Nadu), Cochin (Kerala) and Falta(West Bengal).

The incentives given to such units are :

- 1) Exemption from basic, additional and countervailing customs duties on raw materials, components, consumables, spares, tooling and packaging materials etc. imported in to the zone.
- 2) No license is required for import of capital goods (whether new or second hand), raw materials, consummables, spares, tooling or packaging materials.
- 3) Exemption from Central Excise Duty and other levies on products manufactured within the zone. And also on goods brought into the EPZ from the DTA for use in production or in connection with the production of goods for export.
- 4) Simplification of procedures : All clearances relating to industrial licences, foreign collaborations, are accorded from a single window platform viz. via the concerned EPZ board.
- 5) Capital goods and all other inputs supplied to the zone from the rest of the country are treated as deemed exports and suppliers are eligible for import benefits.
- 6) Duty- free import of capital goods and equipment from preferred sources.
- 7) No restriction on foreign shareholdings in companies that set up units in EPZ.
- 8) Central sales tax paid by the units on purchase is reimbursed by the zone.
- 9) Exemption from restrictions under the export control order on products manufactured and exported from the zone, except textile items.
- 10) Term finance at concessional rates of interest for fixed

assets.

- 11) Packing credit facility for a period of 180 days even in absence of firm export orders of letter of credit.
- 12) Products manufactured in the zone are permitted to be sold within India against a valid import licence.
- 13) Remittance of profits and dividends earned by foreign investors in the zone are allowed freely after payment of taxes.
- 14) Liberalisation of foreign exchange controls including permit for business visits abroad.
- 15) Complete tax holiday for a period of five years. This could be any consecutive five years in first eight years of operation.
- 16) Priority release of telephone and telex connection.
- 17) Units can opt for cash assistance on export which is 50% of the normal rates in such a case. Reimbursement of CST on raw materials to the zone units, and cash incentives to the domestic supplier of raw materials will not be admissible.
- 18) Domestic sales of even such items whose import is not allowed (excluding certain sensitive items) can be permitted. The percentage of such sales is dependent upon the proportion of imported raw materials consumed.
- 19) Diesel is available to the exporting units and is supplied at subsidised rates.

2.3.2 100% Export Oriented Units Scheme (EOU):

The 100% Export oriented unit scheme envisages an industrial unit offering for export, its entire production, excluding rejects or items otherwise specifically permitted to be supplied to the Domestic Tariff Area (DTA).

Industrial units approved by the board set up for this purpose will alone be eligible for import duty without payment of customs duty, capital goods (whether new or second hand), office equipment, prototype and technical samples, generating sets, raw materials, components, consummables, intermediates, packing material, material handling equipment like

fork lifts and spares under Open General Licence. Items banned for import in the DTA, however are not allowed to be imported.

Incentives with regard to tax holiday, foreign investments are similar to those for EPZ units.

2.3.3 Software Technology Parks (STP) :

Software technology Park (STP) is a 100% export oriented development project for export of software on 100% export basis using data communication link or in the form of physical export. Government of India has set up seven technology parks, at Pune, Bangalore, Hyderabad, Bhubaneshwar, Thiruvananthapuram, Gandhinagar and NOIDA.

No import licence is required for import of equipment into the technology park. Department of Electronics issues an import certificate which enables the exporter to import the equipment in the technology park area. All the imports into the technology park are completely duty free. The export obligation on STP units on net foreign exchange terms in US dollar value is calculated as follows:

Export obligation = 1.5 * (CIF value of the hardware imported for which foreign exchange is released by government of India) + 1.5 * wage bill.

The obligation on the hardware can be fulfilled over a period of four years while that on the wage bill has to be on an annual basis.

2.3.4 Indian Copyright act :

The Indian Copyright Act treats software as intellectual property. However, the Customs Act considers the software as a product and imposes an import duty both on the media(floppy diskette) as well as the software it contains. At the same time, the income tax act also treats software as an intellectual property and imposes a withholding tax on the royalty(Aggarwal A.,1993). International practice followed in this area is not levying customs duty on software to be adopted. As a result of this anamoly, the price of imported software packages which are used by software firms increases the overheads in their final products.

CHAPTER 3

LITERATURE SURVEY

Industry analysis has significant importance in the systematic assessment of dynamics which shape the present and future course of an industry. Noteworthy contributions in this area include those made by Scherer, Bains and Porter. In this work an attempt has been made to analyse various issues affecting Indian software industry (which has significant presence in exports). Hence, we have also used Porter's framework related to Forces driving industry competition and other factors related to Competitive advantage of Nations.

3.1 COMPETITIVE FORCES IN AN INDUSTRY:

An industry has been defined as " the group of firms producing products or services that are close substitute to each other." The nature and degree of competition in an industry hinges on five forces : the threat of new entrants, the bargaining power of customers , the bargaining power of buyers, the threat of substitute products or services and the jockeying among current contestants. The collective strength of these forces determines the ultimate profit potential of an industry.

1. Threat of new entrants:

The seriousness of threat of entry depends on the barriers present and on the reaction from existing competitors that the entrant can expect. Strategic decisions of a major player in an industry can have major impact on the conditions determining the threat of entry. The six major sources of barrier of entry are: economies of scale, product differentiation, capital requirements, cost disadvantages independent of size, access to distribution channels, government policy. The barriers to entry changes as the above conditions change.

Building barriers to entry in service businesses is generally more difficult, or atleast must be done in less traditional ways, than in product oriented businesses (Thomas R.E,78). In the product oriented business, the physical reality of the product provides a powerful base on which to build a business description in contrast to service oriented business where services are more abstract. In product oriented companies, capital is the most commonly used barrier to the entry of competition, service businesses rarely have this luxury. The service, because it is abstract ,and time dependent may be delivered sometimes even by a single individual. This results in decentralisation of service production production process to the local level and a reduction in the opportunity for developing economies of scale. As a result location decision are often very important and multiple locations can serve as barriers to entry. In software development where tasks cannot be automated because human judgement must be exercised , sources of cheap and skilled programmers are necessary to develop competitive advantages. But the advantages created on the basis of factor cost are temporary and can be easily acquired by competitors by simply establishing development facility in countries where such low level advantages exist (Porter,92).

2.Bargaining power of Suppliers:

Suppliers can exert bargaining power on participants in an industry by raising prices or reducing the quality of purchased goods and services. Powerful suppliers can thereby squeeze profitability out of an industry to enable it to recover cost increases in its own prices. A supplier group can create unfavourable conditions for an industry when the supplier group is dominated by a few companies and is more concentrated than the industry it sells to. Buyers having high switching costs because the product supplied is unique may have to source from them even though the supplier sells its products at higher prices. Suppliers can pose threat by integrating forward into the buyer's business. Thus the profitability of the industry depends on the profile of suppliers to this industry. For software industry the

main suppliers are computer hardware vendors and software firms supplying system software and other peripherals used by software firms.

3 Bargaining Power of Buyers:

Customers can force down prices, demand higher quality or more services, and play competitors off against each other thereby resulting in the decrease of industry profits. A buyer group is powerful when it is concentrated or purchases in large volumes. Large volume buyers are particularly potent forces if heavy fixed costs characterize the industry unlike software industry where fixed cost does not form a large percentage of total cost. In the situation when the product it purchases from the industry are standard or undifferentiated, the buyer has liberty of using discretion as switching costs are not high. A buyer can pose a considerable threat of integrating backward to make the industry's product.

The power of each important supplier or buyer group depends on a number of characteristics of its market situation and on the relative importance of its sales or purchases to the industry compared with its overall business.

4. Substitute products:

By placing a ceiling on prices it can charge, substitute products or services limit the potential of an industry. Unless the industry can upgrade the quality of the product or differentiate it somehow it will suffer in earnings and possibly in growth. Substitute products that deserve the most attention strategically are those that - are subject to trends improving their price-performance trade-off with the industry's product, or are produced by industries earning high profits. In case of software products, preference for customised application software and standardised package (which may be substituted in some circumstances) depends on the clients requirements and the

price he can afford to pay (Wang T.L., 93).

5. Jockeying for position :

Rivalry among existing competitors takes the familiar form of sustaining or gaining market share by using tactics like price competition , product introduction.Rivalry can be intense because there are large number of competitors or competitors are roughly equal in size and power. In the conditions when Industry growth is slow, the rivalry among competitors can intensify. When the product or service lacks differentiation or switching costs, the buyers segment of competitors could be easily targeted as barrier are not high. Rivalry can be intense when the augmentation in capacity is high result in greater impact on existing participants. In the industry where exit barriers are high the participants continue to stay trying to sustain themselves as exiting provides no returns on the sale of assets.

In case of Indian software industry where there are numerous firms and of roughly the same size (Chapter2), the competition is still not intense (high profit margins still exist(Capital market,93) becuse industry as such is in growth phase(Chapter2).

Industry evolution is considered important strategically because it brings with it changes in the source of competition. For example in the minicomputer industry , as profit margins are getting squeezed the firms are now diversifying in software development where profit margins are considerably high(Sherman S.,93).

It has also been emphasised that strategic thinking in service business is different than that in product oriented business(Thomas R.E.,78).Software differs from conventional, "hard" products made from interchangeable components and

constructed through sequential assembly process; it is primarily an iterative process of design, coding, testing and redesign (Cusumano,89). There are only a few industry wide standards for product features, tools or project management techniques. Software development requires adhoc responses from highly skilled programmers. Inspite of impediments in achieving economies of scale(Banker,89,91) many big global software houses began using the concept of software "factory" in the 1960's when they began to consider more efficient software development approaches. Experts define software factory as- A software factory should be programming environment residing upon and controlled by computer. Program construction, checkout and usage should be done entirely within this environment and by using the tools contained in the environment....A factory has measures and controls for productivity and quality. Financial records are kept for scheduling and costing. Thus management is able to estimate from previous data. Among the tools to be available in the environment should be compilers independent of languages; simulators, instrumentation devices and test cases as accumulated; documentation tool - automatic flow charters, text editors [and] indexes; accounting function devices; linkage and interface verifiers;[and] code filters (and many other) (Cusumano,89). The efforts for factory approach has met with mixed success. In India such a concept of Software factory has gained importance with firms setting software factory (Infosys,93).

Management of a business firm is a very large complex of activities which consists of analysis, decisions, communication, leadership, motivation, measurement and control. The process of decision making (which precedes action) is the corner stone of successful management in a firm. To streamline one's process of decision making, business firms need to have its goals and objectives explicit. In the literature on strategy many authors would have different definition on issues pertaining to strategy(C.W.Hofer,D.Schnedel). Ansoff defines Objective as a criterion by which the firm's success (or failure) is determined and contains three elements: the particular attribute that is

chosen as a measure of fulfillment of criterion, the yardstick, or scale, by which the attribute is measured, and the goal- the particular value on the scale which the firm seeks to attain. Johnson and Scholes define mission as a general expression of the overriding premise of the organisation, which ideally, would be in line with the value and expectations of major stakeholders and is likely to be concerned with the overall purpose of the organisation, it's scope and it's boundaries. Goals are general statement of direction in line with the mission and objective is a more precise statement of goals.

Strategies are classified according their focus (Ansoff,87). Corporate level strategies identify which businesses the organisation intends to be in and how the resources will be allocated among these businesses. Business level strategy focuses on how to compete within a given business. It determines the competitive approach for companies which have a single product or have units of a multiproduct organisation (Porter,80).

3.2 GENERIC STRATEGIC ALTERNATIVES:

By nature, business- level strategies tend to be much less generic than corporate level strategies(Rue, Holland,92). This is so because most business level strategies must be fitted to unique business situation in terms of organisation's position in the industry and the competition. Most business level strategies can be categorized into three major types (Porter,80):

1.Overall cost leadership:

The reason behind folowing an overall cost leadership strategy by a firm is to be enable it to produce and deliver the product or service at a lower cost than its competitors. Cost leadership is usually attained through a combination of experience and efficiency. Cost leadership can help a firm achieve above average returns even when there are

strong competitive forces. It can help defend the firm against its rivals as it is difficult for competitors to force the firm out on the basis of price. It can also defend the firm against powerful suppliers by providing it flexibility to deal with input cost increases. Also the factors which contribute to a low cost position can provide substantial barriers to entry if such factors are difficult to develop.

Achieving an overall cost leadership requires that company develop some unique advantage over its competitors. For software company such a leadership could be achieved by using better project management techniques and reusing the previous codes(Standish,84, Stamps,87, Boehm ,87).

2. Differentiation of Product or Service :

A differentiation strategy involves doing something so that the product or service is perceived as unique in the industry. Generic product can be sold only if the customers wide expectations are met (Levitt T.,80). Different means may be employed to meet these expectations(Levitt T.,76). Hence, differentiation follows expectation. Not all customers for all products and under all circumstances, however can be attracted by an ever expanding bundle of differentiating values satisfaction. Some customers may prefer lower prices to augmentation. Differentiation could be achieved by brand image, technology, quality, additional features, customer service(Kotler P.,92), updating existing software packages at no extra cost. Differentiation can provide protection against competitors because of brand loyalty by customers which create barriers in targeting the buyers by competitors. It helps in increasing margins because of the ability to charge a higher price from buyers. It can help in decreasing the bargaining power of buyers as there would be no comparable alternatives available to buyers..Because of customer loyalty differentiation can put the company in a favourable position to fight against substitute from competitors.

Efforts have been made to differentiate between the marketing concepts applied to Intangible products and product intangibles(Levitt T., 81) and importance of differences existing in making promises about intangibles(Rathwell J.M) in following differentiation strategy.

3. Focus of the product or service:

A third generic strategy is to focus on market segment. The segment sought may be defined by a particular buyer group, a geographic market segment, or a certain part of the product line. As opposed to low cost and differentiation strategies, which have industry wide appeal, a focus strategy is based on the premise that the firm is able to serve a well defined but a narrow market better than its competitors who serve a broader market. The basic idea of focus strategy is to achieve a least cost position or differentiation or both, within a narrow market segment.

Each of the three generic competitive strategies has certain associated risk and each requires different skills and resources in different organisational setting to be successfully implemented (Porter,80).

3.3 GROWTH MECHANISMS:

A belief that company must grow if it is to survive has resulted in growth oriented strategies being preferred over other strategies (Stability, Defensive and Combination) and has been predominant in small business units(inc.May 1987). Growth mechanisms that firms normally use to implement growth strategies are:

1. Internal Growth :

When a company expands its current market share, its market, or its products through the use of internal resources, internal growth takes place. It usually takes place over an extended period of time; allowing time to adjust to the change. Internal growth is advantageous when the start up synergy is strong, even if operating synergy is weak(Ansoff). The firms competence pattern assures a fast start and low risk although there may not be operating economies. Growth through internal means is incremental and can be terminated at almost any time. Generally internal growth strategies work well for companies whose product or services are in the early or middle stages of the product service life cycle(William F. Glueck,90).

2. ACQUISITION OR MERGER:

An Acquisition occurs when one company purchases the assets of another and absorbs them into its own operations. A Merger occurs when two or more companies combine into one company. In an acquisition one company clearly acquires another; in a Merger neither participant acquires the other, but rather both companies merge together, combining operations and resources. Growth through acquisition can help avoid or eliminate many barriers to entry, such as patents, costly promotions, and broad recognition. Growth through acquisition or merger is not incremental, and it requires a total financial commitment from the start. Entry into new, unrelated businesses (where there is weak start up synergy) is usually more successful through acquisition than through internal growth. There has been instance of a Indian software firm being acquired by a business house having interest in different areas (Sarkar.A,93). Absence of synergy points to acquisition in most cases. Exception is a situation when the premium on timing is low (Ansoff). Reasons cited for merger or acquisition of another company include improving or maintaining competitive position in a particular business in order to enter new market or acquire new products rapidly, to improve financial

position, or to avoid takeovers(Lubatkin M.83, 87). Beside the strategic considerations for choosing a firm (Jennison and Haspeslagh,91) equally imporatnt is the process of integrating the management operations, and cultures of acquired company (Nahavandi and Malekzadeh, 88). With few exceptions it is difficult to obtain operating leverages in service businesses particularly those that are people based (Thomas R.E.,78) and hence mergers in software business would be difficult to materialise.

3. JOINT VENTURE:

A joint venture occurs when two or more organisations pool their resources for a given project or a business product. There are a variety of arrangements for joint developments and alliances (Scholes). Some may be very formalised inter organisational relationships; at the other extreme there can be very loose arrangements of cooperation between organisations with no shareholding or ownership involved. The reasons why these different form of alliances might occur are varied (Lorange and Ross, 92), but they are most likely to be concerned with the assets involved in the joint ventures. One of the reasons to have joint venture could to be have sufficient resources which may not be possible if participants try to pursue alone. This also helps in sharing the risk involved in a venture.

Joint ventures are especially popular between firms in different countries and it being so attractive in the international setting is that both the host firm and the entering firm benefit. Additional benefits for both parties is that less individual investment is required. Joint ventures in the international setting work best when the culture and economic conditions of the different partner are similar (Wright and Russel, 75). Beside this marketing tieup and technology tieup arrangements can also give boost to growth of a firm as new avenues are opened up.

3.4 DETERMINANTS OF NATIONAL ADVANTAGE:

In his landmark work on International trade and competitive advantages , Michael E.Porter emphasises the role played by a nation's economic environment, institutions, and policies in the competitive success of its firm in particular industries. According to him nations achieve international success in a particular industry on the basis of four broad attributes which shape the environment in which the local firms compete. These determinants of national advantage are:

1. Factor conditions:

A nation's firms gain competitive advantage if they possess low cost or uniquely high quality factors of the particular types that are significant to competition in particular industry.

Factors can be of two types viz. basic factors and advanced factors. Basic factors include natural resources, climate, locations, unskilled and semi skilled labour and debt capital. Basic factors are passively inherited, or their creation requires relatively modest or unsophisticated private and social investment. Increasingly, such factors are either unimportant to national competitive advantage or the advantage they provide are unsustainable. Basic factor remain important in industries where technological and skill requirements are modest and technology is widely available. Advanced factors include modern digital data communications, infrastructure, highly educated personnel such as graduate engineers and computer scientists and university research institutes in sophisticated disciplines. Advanced factors are the most significant ones for competitive advantage as they help firms in innovating new products or new ways of rendering service. They are necessary to achieve higher order competitive advantages such as differentiated products and proprietary production technology.

The second important distinction among factors of production is their specificity. Generalised factors include the highway system, a supply of debt capital. They can be deployed in a wide range of industries. Specialised factors involves narrowly skilled personnel, infrastructure with specific properties, knowledge bases in their fields, and other factors with relevance to a limited range or even to just a single industry. Specialised factors provide more decisive and sustainable bases for competitive advantage than generalised factors. Specialised factors require more focused, and often riskier, private and social investment. The most significant and sustainable competitive advantage results when a nation possesses factors needed for competing in a particular industry that are both advanced and specialised factors which determine the sophistication of competitive advantage that can be potentially achieved and the rate of upgrading of existing skills.

2. Demand Conditions:

Home demand conditions shapes the rate and character of improvement and innovation by a nation's firms. Three significant broad attributes of home demand are : the composition (or nature of buyer needs) of home demand, and the mechanisms by which a nation's domestic preferences are transmitted to foreign markets. In India still arcane methods are used by Indian businesses as a result baring few exceptions home demand conditions have rarely provided a chance to develop competency in preparing a world class software.

3. Related and Supporting industries:

The presence or absence in the nation of supplier and related industries that are internationally competitive. Because of absence of supplier industries (Computer hardware and systems software) in India , the late entry of Indian software exports can be justified.

4. Firm, Strategy, Structure, and Rivalry:

The conditions in the nation governing how companies are created, organised, and managed , and the nature of domestic rivalry effect substantially how advantages are created. The goals, strategies, and ways of organising firms in industries. Very widely among nations. National advantages results from a good match between these choices and the sources of competitive advantage in a particular industry.

The determinants, individually and as a system create the context in which a nation's firm are born and compete; the availability of resources and skills necessary for competitive advantage in an industry ; the information that shapes what opportunities are perceived and the direction in which the resources and skills are deployed; the goals of owners, managers, and employees that are involved in or carry out competition; and most importantly, the pressure on firms to invest and innovate.

Firms gain competitive advantage where their home base allows and supports the most rapid accumulation of specialised assets and skills, some times due solely to greater commitment. Firms gain competitive advantage in industries where their home base affords better on going information and insight into product and process needs. Firms gain competitive advantage when the goals of owners, managers and employees support intense commitment and sustained investment. Ultimately nations succeed in particular industries because their home environment is the most dynamic and the most challenging which stimulates and prods

firms to upgrade and widen their advantages over time.

It has also been emphasised that competitive advantage based on only one or two determinants is possible in natural resource dependent industries or industries involving little sophisticated technology or skills. Such advantage usually proves unsustainable however, because it shifts rapidly and global competitors can easily circumvent it (Datamation, 93). The effect of one determinant is contingent on the state of others. Advantage in every determinant is not a prerequisite for the competitive advantage in an industry. The interplay of advantage in many determinants yields self reinforcing benefits that are extremely hard for foreign rivals to nullify or replicate.

Two additional variables that can influence the national system in important ways are Chance and Government. Chance events are developments outside the control of firms, such as pure inventions, breakthroughs in basic technologies, wars, external political developments and major shifts in foreign market demand. They create discontinuities that can unfreeze or reshape industry structure and provide the opportunity for one nation's firm to supplant another. They have played an important role in shifting competitive advantage in many industries.

Government at all levels can improve or detract from the national advantage as the policies influence each of determinants. Policies implemented without consideration on how they influence the entire system of determinants are as likely to undermine national advantages as enhance it. Policy decisions taken by client country can seriously undermine the advantages that firms in a particular country enjoy (Sharma R., 93) e.g. the recent change in visa rules are seriously effecting on site services business of Indian software firms (Mehta D., BOSE A.C., 93).

3.5 COMPETITIVE ADVANTAGE OF INDIA IN SOFTWARE BUSINESS:

There are many factors which determine the export performance of a country (Sharma O.P.,92). Indian software exports have shown a sharp growth rate in previous 6 to 7 years and Indian firms still continue to enjoy a prominent position in overseas software development(chapter2). It is the inherent characteristics in the software services as such which together with the factor advantages that India possess provides Indian software firms competitive advantage over their competitors in other countries. One of the most important characteristic of software development process - requirement of a skilled programmer for developing efficient algorithm and coding, has resulted in access to sources of relatively cheap but skilled programmers as a strategic requirement for developing low cost application programs. This has opened up avenues for outsourcing application development by western firms to overseas programmers (Naqvi R.H., 93) (normally in countries where manpower cost are cheap) . In outsourcing the client (normally western) firms after having done upfront analysis and problem solving contracts an overseas software firm for writing and testing the code. At present the market for overseas off shore programming is worth US\$200 million (Krepchin I., 93). In this area of software development certain factor advantages provide competitive advantage to Indian software firms in International software business. These advantages are :

1.Relatively inexpensive and talented Manpower:

India has a large reservoir of highly skilled technical manpower. It has a growing bank of 2.5 million technical personnel, some of them best in world. There are at present 970 technical institutes and polytechnic which train 20,000 people annually and 182 engineering colleges including IITs. In addition 14000 young people graduate every year from 475 institutions which conduct courses(NASSCOM,93). As compared to prevailing international rate of skilled programmers, Indian

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programmers cost a fraction of their counterparts in western or developed countries. The hourly rates for highly trained Indian programmer is US\$12 to US\$15 as compared to world average of US\$20 an hour(this rate is without taking into account the travel or communications costs) whereas those of the american programmer ranges from US\$50 per hour to US\$150 per hour (Krepchin I,93). This parity in cost of hiring a programmer has made India a vital source of software programmers who have also exemplified in this area by continuous training and upgrading their knowledge.

2. Biggest pool of English speaking Man power:

Since software development (an iterative process)solely hinges on programmers (Cusumano,89)(leaving little scope for machines to do the coding) hence, interaction of clients with them gains a critical importance during the software development phase. As the language of instruction in Indian colleges and universities is english hence it provides indians competitive advantage (as compared to firms in countries where english is not a media for communication)in dealing with clients in countries where business is carried in english (incidentally the english speaking countries have the biggest share in the global software market). One may attribute familiarity of language to be an important reason for high percentage of export sales to USA, UK and a deprssed share of exports to France, Germany and Japan which use their own regional language for purpose of business.

3. Mathmatical Mindset:

Educated indians by their intellectual orientation are found to be more capable in mathmatical reasoning abilities (Ghosh. P., 93), an attribute of immense importance in developing algorithms, than their conterparts in developing or developed countries .A good mathmatical background helps in designing efficient and less time consuming algorithms which are quicker to execute, occupies less memory space and hence more

preferable(Albercht A.J,83 and Boehm, 81). Completion of some very critical projects by indian software firms justify this mindset as an important advantage over their competitors who have a different profile of programmers.

The presence of all the above factors have provided Indian software firms an advantageous position in providing software solution at low cost as compared to many of their competitors in other countries.

CHAPTER 4

PURSUIT AND PLAN OF STUDY

Since this study aims at analysing various operational and strategic aspects of Indian software firms operating in India, hence to collect the necessary data a set of research questions was generated for this exploratory work. The nature and content of these questions was broad based and related to Indian software industry in particular. A detailed literature survey was carried out (chapter 3) for the relevance and researchability of the questions and requisite refinements were carried to suit their relevance.

The specific questions generated were :

- 1) Reasons for entry into software business.
- 2) Difference in software professional composition on the basis of their educational background in software firms and its relation to innovativeness in tapping different application areas.
- 3) Whether there are any remarkable differences in pursuing various growth mechanism for export and domestic market.
- 4) The profile of the buyers of software products and software services.
- 5) Important competitors (countries) in international market and whether their exists any relation between size of company(in terms of export sales) and competitor's country.
- 6) Difference in composition of software services in Export and Domestic market.
- 7) Effect of Data communication satellite link on Off Shore sales.

For the purpose of this study following objectives were set forth.

- a) To study the various aspects affecting the Indian software

industry.

- b) To study the differences in the operational and strategic behaviour of software firms of different sizes (on the basis of number of employees and sales).
- c) Differences in strategies related to export and domestic market.
- d) To test hypotheses related to the aforementioned issues.

The underlying assumption for this study is that the firms are likely to have differences in both strategic and operational preferences. This assumption has been supported by both conceptual (Porter M E, 1980) and empirical(Dess C G,Davis PS 1984 ,Demeyer etal,1987) studies.

The nature of this investigation calls for a broad based and survey oriented research methodology. Keeping this fact under consideration a questionnaire based survey of Indian computer software industry was thought of. The design of this survey, the description of the selected sample etc. is as mentioned below.

4.1 QUESTIONNAIRE DESIGN:

In order to achieve aforementioned objectives a data collection tool was designed, which helps in collecting the requisite data.

The first section of the survey deals with the reasons for entry into software business and also covers the investment made in the setting up of software business, gestation period and the entry route(export or domestic or both). This section has been included in order to study the underlying reasons for entry into this business, which also helps in determining the entry barriers and ultimately the level of threat of new entrants as perceived by existing participants. Each reason has been

divided into four different levels of importance thereby helping us in determining the relative importance of each factor. In case of non applicability , clarification or additional alternatives have been sought to assess any important factor that has not been considered by us. This basic approach has been followed in all subsequent sections of the questionnaire.

Next section deals with status of infrastucture and locational facilities and reasons associated for chosing the most recent location as a software development facility. Geographical locations of representative offices and software development facility are of strategic importance in sevice business (Thomas.R.E., 78).

The section on Human resource deals with total number of employees, composition of software professional (based on their educational background). Since the cost of programmers constitute a high percentage of total cost of developing a software package (it could be in the range of 50% of the total cost) (Business Today,Jan'94), and the quality of the code so developed depends on the professional involved in this process hence, the background of a programmer has an important bearing on the quality and the innovativeness of the product so developed. Since developing a code is many a times result of an individual's effort(Cusumano,1989) hence a flexibility of time schedules on part of programmers to utilise hardware can improve the sales/hardware cost and thus a better utilisation of hardware.

The section on financial results attempts to gauge the financial performance of software firms in previous three years. This was on the basis of the observation made by the previous researchers (Lawrence P.R. and Lorsch J. W., 67) that even with assured confidentiality of organisational identity it is virtually impossible to obtain important data and especially financial data. But this study being also about analysing aspects

of industry we need to take into account not only effectiveness with which a firm implements its chosen strategies but also the effect of the state of economy, industry characteristics and the choices of strategies themselves (Lenz R. T.,81) which are truly reflected in the financial performance of a firm.

The strategic aspects were included in the section which was pertaining to operational aspects. This section covered aspects related organisational structure, goals, generic strategic alternatives and growth mechanisms preferred. Also the part on business strategy differentiated between emphasis on various generic strategies in export and domestic segment.

The section on buyer's profile is aimed at finding the type of industries to which the main buyers of software product or services belong to. This helps in determining the effect of economic factors on software industry which may not directly affect the software industry as such but the industry segments to which the buyer's belong . Percentage composition of Off shore and On-site sales in exports helps in determining the percentage composition of exports as a result of body shopping(which is not considered a highly value added business and to a great extent determines the opportunity bagged as a result of low labour cost) contracts. Greater On-site sales percentage represents higher exposure to changes in international visa regulations and at the same time a possibility of a higher employee turnover as many software professionals have shown tendency to take job in client country because of better monetary benefits. Hence, On-site sales signifies the risk a firm is exposed to, of loosing its software programmers and determental effect on a firm's performance as a result of change in visa regulation.

The section on tieup arrangements includes Marketing Tieup and Technology Tieup arrangements. This section

aims at determining the nature of business in which the foreign collaborators are presently engaged in and the country to which they belong to. Nature of business of the collaborator helps in determining the reach that is possible in marketing software services to different segments .

The section on product profile aims at finding percentage composition of software services in domestic sales and export sales which determines the capability and needs of buyers in a particular application areas . The portion on ranking of percentage share of various application areas in domestic and export market enables the level of emphasis on these application areas. Size of the projects helps in determining the opportunities existing in export and domestic market and whether the size of project in one market has any bearing on other.

The section on use of platforms determines the hardware and software capability of firm and the ability of the firm to keep abreast with the latest technological developments.

The last section contains question pertaining to effective means of promotion , entry into new application areas, innovation in software development methods, countries to whom the maximum export sales are directed and the countries whose software firms are main competitors.

4.2 HYPOTHESES:

In this exploratory study, we collect and analyse data mainly to generate a range of hypotheses about the Indian Software Industry. We have however, a small set of hypotheses formulated through study of the sparse literature on this Industry. Mentioned below is the rationale for these specific hypotheses which we have tested in this research work.

1. Differences in composition of software services in export and domestic sales:

The dynamics of export and domestic market are significantly different (Kotler.P.,92) and hence differences in percentage composition of software services in export and domestic market can exist. When we consider such a difference in context of Indian software firms then the two different types of services in which we can broadly divide the total sales could be - customised application software and Standardised software package. Here we have considered any software product/service which is not Standardised as customised application product or service. Hence, turnkey solutions, and reengineering services also fall in the category of customised application software.

Customised application area basically means developing software solutions specifically for a particular "client". The type of work can vary from firm to firm and also depends on whether it is overseas buyer or a domestic buyer. For example chances of a software firm being given upfront analysis or problem solving can be very slim when one caters to foreign clients(Krepchin I.,93) as that compared to taking a software assignment from a domestic buyer. Software development requires two separate skills: computer science expertise and application knowledge(business knowledge) (Royce.W,93). Thus in order to make a Standardised package one also needs to know the business practices of countries where one is targetting this package. Since, Indians are not well exposed to business practices in other countries, it is extremely difficult to make a package which has a universal appeal at the same time this also involves big investment. This handicap also results in many Indian firms getting software projects which involve more of coding rather than upfront analysis. Based on this reasoning we can for the moment surmise that the maximum percentage of export sales would consist of customised application software or services.

In case of domestic market, where the use of computers in the business is still in the growth phase as compared to international usage, the ignorance on part of many users in the initial phase of use of computers provide greater opportunity for Standardised package. It is with time when one gets acquainted with the computers that a need for specific application suitable to one's requirement is felt resulting in increased demand for customised application solution which many a times could be met by inhouse software development. Because of this we may say that at present selling imported Standardised packages would normally form a major percentage of domestic sales. Hence, we can hypothesise:

"Composition of software services in export sales would be dominated by customised application software solutions whereas in case of domestic market selling of imported standardised packages would constitute maximum percentage in domestic sales".

2. MEANS OF PROMOTION:

Since many of the software firms operating in India are of small size and also young(in respect of their period of presence in software business), the promotion has to be in a manner which initially provides these firms an opportunity to interact closely with their clients so that long term relationship can be built. This places an emphasis on a more personalised approach and more so when one is in the service business. In case of emerging industry the ability to educate customers and building personal relationship with them is of vital importance. Also since the names of Indian software firms are not well known in the world (except for a few who have been operating for a long period) like those of some american information technology giants like IBM, Microsoft etc. Hence it is the personal contact which

firm develop over time with their clients (providing an opportunity of repeat orders) that gain significance. It could also be inferred that higher concentration of software exports to USA is not only because of its market potential but also because of presence of NRI's in the information technology business, the personal contacts with whom provides firms an opportunity to tap the market. The presence of representative offices signifies the importance a firm gives to being in close contact with potential and existing clients. Sponsorship and advertisement in global print media are a costly means of promoting which Indian firms cannot afford because of less finances available with them. Also a higher concentration on developing customised solutions prods firms to be in contact with their clients. Based on the above reasoning we can say that:

"Most effective means of promotion would be the personal contacts developed over time rather than sponsorship or advertising in print media."

3. PREDOMINANT GROWTH MECHANISM:

On the basis of the arguments made by researchers on the suitability of growth mechanism preferred for growth (chapter3) strategy we can say that the preference would be biased towards internal growth or a joint venture. The preference for one of these will depend on- the life cycle stage in which industry is at present , the structure of industry as regards to concentration, the size of a firm and the competencies developed by the firm. Indian software industry can be considered as highly fragmented (chapter2) and at the same time emerging industry. The setup cost involved in software business is low (could be lakhs of rupees). At the sametime entry into an emerging industry like software industry , would result in hardly any high level of

retaliation from existing participants. This is so because the financial performance of existing participants will hardly be affected even though an entrant takes some market share. The new capacity so added by the entrant is quickly utilised by the growing market demand without depressing the prices. Moreover, in a fragmented industry like Indian software industry, the entrant may affect many firms but have only marginal impact on each. As a result none of the existing participants will be hurt badly enough to retaliate vigorously, and none is likely to have the capability to inflict a penalty on a new entrant. Thus, an expectation of less retaliation from the existing participants provides an opportunity to pursue internal growth rather than joint venture which carries with it additional problems like coordination with the partner and the span of control exercised by each entity. Based on the above reasoning we can surmise and test the below mentioned proposition:

"Internal growth will be a predominant growth mechanism rather than joint venture, acquisition or merger."

4. DATACOMMUNICATION SATELLITE LINK AND OFF SHORE SALES:

One of the most important characteristics of software product is that it can be easily transported in any part of the world (provided communication links exist) within seconds with the help of high speed datacommunication satellite links without any errors (baring few cases). At the same time one can use such a link for a closer interaction with one's client during the development phase of software code thus providing an opportunity of not deputing personnel at client's site. One can by using such a communication link plug into overseas hardware

facility at the client's site and can even carry on the maintenance of software so installed. As a result Indian firms using these links can substantially reduce the travelling expenses on their personnel and also be more immune to visa regulations and turnover of its software professional. Because of the technological and economic benefits derived from usage of such a communication link we can hypothesise:

"For firms having and using high speed datacommunication satellite links the percentage share of off-share sales in total export sales will increase over time."

5.FOCUSSED STRATEGY:

As most of the firms are small in size hence, we can expect them to operate in a narrow market as they may not have enough critical mass to operate in a broad market segment(Ansoff). To have cost leadership one needs to have volumes which can substantially reduce unit cost which in case of a service industry is more difficult to achieve (Thomas R.E., 78). The small size of the firms forbids them to seek such ambitious targets as it involves high marketing expenses which Indian software firms can hardly afford. Hence, such small firms would rather focus on narrow segment and serve them better than their competitors. Differentiation of products and sevices requires a firm to make heavy investments in R&D and marketing (Kotler.P.,92) which are some of the weaknesses of the Indian firms. Hence on the basis of the observation made (chapter3) we can expect Indian software firms to generally follow Focussed strategy. In software business a firm can focus mainly on three aspects i.e application areas, geographic market segment and specific user segment.

Since developing an application software requires both business knowledge and computing expertise(Royce.W,1993) therefore focussing on a particular application area helps a firm to concentrate its resources in a more efficient manner. It is

also seen that use of certain programming languages is suited to developing software codes pertaining to specific application areas, hence focussing on application areas helps a firm to achieve expertise and higher productivity in writing codes. Many of the application software solutions have very wide appeal. For example developing expertise in writing codes for accounting solutions can help a firm take projects from varied industry segments as much of the basic concepts remain same (though some changes may be required depending on certain regulations in countries or businesses) and hence the expertise developed in making one such solution could be easily and effectively utilised in subsequent related projects. Also such a focussing may allow the enhancement of product differentiation with the customer as a result of the specialist's expertise and image in the particular area. Such a strategy also allows the firm to be better informed about the application area and helps them in providing better services to their clients related to the targetted application area.

Since working on different application areas to cater a specific user segment or specific geographical area would require expertise in various areas hence such a focussing does not hold an attractive proposition for small sized company who cannot afford to develop expertise in varied areas. Hence we can hypothesise that:

"Firms would prefer to focus on a particular application area rather than focussing on specific user segment or specific geographical area."

6. International Competitors:

Export sales can be categorised in to two broad categories on the basis of the location (where the development of software is done) - they are Off-Shore sales and On-site sales.

Off-Shore sales means writing a software program at its own facility. In On site sales the complete development and installation process is done at client's site. A high speed datacommunication satellite link helps in executing Off Shore sales (Krepchin.I., 93).

We can broadly categorise software services into two categories- Custom application software (specific to customer) and Standardised Software (could be used by any user). Due to high R&D cost , the investment required in developing Standardised packages is high. It is therefore only large volumes which help in off setting this investments . In case of customer specific applications the cost of programmer plays the crucial role in determining the competitiveness of firm. Thus such projects will normally be taken by firms which have easy access to cheap and skilled programmers. The cost of labour is dependent on the economic conditions,i.e. per capita income Thus, we can say that firms having high concentration of customised application software development will have its competitors from countries having comparable per capita income. Based on the above rationale we can hypothesise:

"Normally Indian Firms with high percentage of customised services will have its competitors belonging to less developed countries rather than developed countries."

4.3 DATA ACQUISITION:

The final preparation of the questionnaire coincided with NASSCOM'93 meeting which enabled us to interact (though in a limited way)with the senior executives of the various software firms at this annual gathering. As a result field study was carried so that corrections, if any, could be done before mailing final questionnaire. Questionnaires were mailed to 66 software firms in India. Care was taken to include a wide variety

of firms depending on their size, nos. of employees, presence in application areas, and subsidiaries of a foreign company. Selection of firms was made from the address list received from Electronics and Computer Software Export Promotion Council, and references from Computers and Communications, Dataquest and Stock Exchange Directory.

Each questionnaire was mailed to the chief executive officer of the concerned software firm for response. The chief executive is the most important in deciding the course of firm (Chandler A D, 1962) and hence, is the key person who has maximum knowledge of his business and his firm. Since questionnaire aimed at finding some strategic information hence, a covering letter was also attached explaining the purpose of this research and assuring confidentiality of data and anonymity of the respondent.

The response from industry was around 20%. A total of 14 responses were received. The sample size though regrettable is not uncommon in study of strategies and industry analysis (Porter M E, 1979) and more so when the total number of software firms listed on stock exchanges is 14 (Capital Market, Nov'93).

CHAPTER 5

RESULTS AND ANALYSIS

5.1 Sample and Respondent Profile:

The analysis here is based on the 14 responses received from software firms operating in India. These firms differ substantially from each other in terms of total software sales, number of software professionals employed, number of foreign offices and year of establishment.

This small sample of Indian software firms can hardly be considered representative of the Indian software industry. Since many of the software firms are closely held (not public limited companies) hence we may attribute this as one of reasons for such a small sample. The profile of the responding firms is as mentioned in table(5.1).

TABLE 5.1: Respondents Profile

S.NO	SALES(92-93) (Rs. Lacs)	TOTAL NOS. OF SOFTWARE PROFESSIONALS	YEAR OF ESTABLISHMENT	NUMBER OF FOREIGN OFFICES
1	N. A	140	1991	1
2	N. A	400	1975	3
3	550	125	1989	0
4	110	31	1990	1
5	200	50	1985	1
6	1008	360	1982	2
7	2100	430	1990	1
8	1700	451	1974	3
9	165	82	1987	2
10	1560	328	1990	1
11	200	120	1991	1
12	N. A	100	1985	0
13	1452	433	1981	4
14	2094	334	1985	2

Four firms in the sample are among the top 15 software exporters for 92-93 from India. One among them is in top fifteen domestic players in domestic market for 92-93. Of the 14

firms which responded, 11 firms provided with financial data and six provided with net profit figures. Except for two of them each has atleast one overseas representative office. Most of these firms had one or more than one representative office in USA. None of the responding firms has any software development facility in the foreign location. Seven firms are at present have atleast one 64kbps datacommunication satellite links.

Nine of the above sample have a foreign marketing tieup. Tieup arrangements are mainly with American Information technology firms. Four firms have technology tie up arrangements with firms having their main business in Information technology.

Buyers of their software products and services belong to a very diversified industry segments. In case of export market buyers mostly belong to service sector with main interest in banking, insurance, consultancy. In domestic market the buyers have their interest in manufacturing and service sectors. This shows that software industry is not dependent on buyers who are highly concentrated and hence, the threats posed by them is not very high when one considers factors which have detrimental effect on their performance.

5.2 Reasons for entry in Software Business:

A ranking of the 14 possible reasons for entry into software business by respondents was carried out. The first 5 significant ranks are as shown in table 5.2

TABLE 5.2:

Ranking	Reasons for Entry.
1.	Availability of skilled programmer.
2.	Growing market.
3.	Export earnings.
4.	Higher profit margins.
5.	Low setup cost.

This ranking suggests that availability of skilled programmer is the most important reason for entering in software business which is justified as software development is a creative human intensive task. Preference for export earnings shows that foreign market is considered attractive because of benefits available because of foreign exchange earnings and immense potential that exist in world market for software. Low setup cost makes it easier for small entrepreneurs to enter in this business. We can attribute this as an important reason for the presence of 138 small software firms in domestic market which have total number of employees less than 20. Interestingly devaluation of rupee has not been considered by firms (even those which were setup after July'91) as an important reason. This could be because such a phenomenon does not result in increased earnings as overseas clients may go in for readjustment in prices after major devaluation (Debroy B., 1992). Also not considering financial and marketing backup from foreign partner as an important factor shows that entry barriers are not high to deter a entrant from entering in this business.

5.3 Representative Office:

The reasons sited by responding firms for selecting a particular geographic location for its most recent representative

office are as mentioned in table(5.3).

TABLE 5.3 :

REASONS FOR SELECTING A PARTICULAR GEOGRAPHIC LOCATION FOR
OVERSEAS REPRESENTATIVE OFFICE

1. Demand potential of the regional market.
2. Ease of doing business.
3. Political stability.
4. Host country having cordial relationship with India.

From the above preferences of the respondents we can infer that demand potential of the market is an important factor in selection of geographical location. Also it reflects that the respondents are more inclined to have a longer presence in the selected market as they are not very keen on preferring countries where tax benefits and other financial incentives exist. Above preferences also show that they want to remain close to their potential customers ,one of the characteristics of service business.

5.4 Software development facility:

None of the firms who responded had any "overseas" software development facility. The ranking of the 10 reasons for selecting a software development facility are as mentioned in table 5.4:

TABLE 5.4:

**REASONS FOR SELECTING A PARTICULAR GEOGRAPHICAL LOCATION
FOR SOFTWARE DEVELOPMENT FACILITY.**

1. Govt. subsidies for units under STP, EPZ, EOU Schemes.
2. Availability of working space at cheaper rates as compared to market prices.
3. Uninterrupted supply of power.
4. Data communication links.

Since most of the firms who responded are in the export of software, hence, the govt. subsidies and policy measures in STP, EPZ, and EOU schemes (chapter 2) provides incentive which help in sustaining the competitiveness of software firms in international market. Availability of cheaper working space helps in reducing overhead costs as it is possible that a substantial office space is needed to house hundred's of professionals. Satellite communication link facilities are gaining increasing importance because of the technical and economic advantages it provides to firm (chapter 4).

5.5 Overall Goals:

Responses regarding the overall goals of firms seem to emphasise a long term presence not only in the software business but in the business of Information technology which covers a whole gamut of hardware and software solutions and commitment of the firms to excel to achieve a global recognition. According to responses received the preference of the overall goals of the firms are as mentioned in table 5.5 :

TABLE 5.5:

Ranking	Overall Goals
1	To be a global software firm.
2	To be a total IT solution firm.

5.6 Software professional composition:

On the basis of the responses received regarding the software professional composition (based on their educational background) we found following important characteristics:

- 1) Software firms which are in the business of providing software services in highly technical area like Communication software have a very high percentage (around 85%) of software professionals with educational background in Electronics or Computer science Engineering. This could be because of high technical expertise required in developing software solutions for Communication and Networking.
- 2) Firms which have been providing software solutions related to Finance/accounting to Banking, Insurance, Consultancy and other service businesses have a less concentrated composition of professionals having educational background in Computer Science engineering. Among the firms in our sample which are catering to this market the software professionals having background in either MBA or MCA form an average of 30%. Also such firms have an average of 27% professional having background in engineering discipline other than Electronics or Computer Science. This shows that programmers having skills in areas other than programming only are more beneficial for firms having their interest in developing software solutions in various commercial areas.

This observation shows that there exist some level

of interdependence between the degree of concentration of software professional with a particular educational background and the area in which software firms provide software solutions.

5.7 Financial Results:

The average growth rate of total sales of the firms which responded was 42% in last three years. Equity base of the firms is in range of RS. 200 lacs to Rs.850 lacs . Average of Sales/equity for the year 92-93 of the firms which responded is about 7 : 1. Net profit is approximately 25% of total sales. Such high returns and high growth rates in total sales shows that the Indian Software industry is an emerging industry.

5.8 Hypothesis Results:

5.8.1.Differences in composition of software services in export and domestic sales:

In the questionnaire mailed to the software firms , respondents were asked to specify the percentage composition of various software services in their export and domestic sales for year 92-93. Based on their responses we have mentioned below the paired combination of customised application and standardised packages in export market respectively. They are as mentioned in table 5.8.1.

TABLE 5.8.11 Percentage composition in Export Sales:

CUSTOMISED APPLICATION %	100	100	90	100	100	100	100	40	100	100	80	20	70
STANDARDISED PACKAGE %	0	0	10	0	0	0	0	60	0	0	20	80	30

Results of t- paired test (for $t_{\alpha} = 2.718$ for $\alpha=0.01$,and 11 degrees of freedom and $\bar{d} \sqrt{12/S_D} = 7.45$) supports our hypothesis that customised application area sales dominate in total export

sales as compared to Standardised package.

The paired combination of selling imported packages and others respectively in domestic market sales are:

TABLE 5.8.12 Percentage composition in Domestic Sales:

IMPORTED PACKAGES %	100	60	60	100	40
OTHER SOFTWA- RE SERVICES%	0	40	40	0	60

Results of t-paired test ($t_{\alpha} = 3.747$ for $\alpha = 0.01$, and 4 degrees of freedom and $\bar{d} \sqrt{5/S_D} = 4.3$) which supports our hypothesis that selling of imported packages dominate the total domestic sales.

Hence, above tests supports our hypothesis:

"Composition of software services in export sales is dominated by customised application software solution whereas in case of domestic sales selling of imported standardised packages constitute maximum percentage of domestic sales".

5.8.2. Means of Promotion:

In the question pertaining to various means of promotion respondents were asked to select the most effective means of promotion separately in export and domestic market. The total number of respondents for export promotion were 14 whereas for domestic market total number of respondents were 6. The result of the respondents are as follows:

TABLE 5.8.21: (For Export Market)

Means of promotion	Number of respondents
1. Personal contacts developed over time.	11
2. Through ESC or NASSCOM	2
3. Sponsorship	1

TABLE 5.8.22: (For Domestic Market)

Means of promotion	Number of respondents
1. Personal contacts developed over time.	4
2. Advertising in Indian print media.	2

From the above responses we find that approximately 78% of responding firms which consider personal contacts developed over time as the most effective means of promotion. In case of firms operating in domestic market 66% of respondents consider personal contacts developed over time as the most effective means of promotion. One respondent consider sponsorship as most effective means of promotion in export market. We may attribute this preference as the responding firm is a subsidiary of a multinational group and hence is financially capable enough to finance sponsorship campaigns. Thus above results substantially support our hypothesis :

"Most effective means of promotion would be the personal contacts developed over time rather than sponsorship or advertising in print media".

5.8.3. Predominant growth mechanism:

In the question pertaining to effectiveness of various growth mechanisms respondents were asked to prioritise the various mechanisms on the basis of their effectiveness in Software business. The rankings are as mentioned in the table 5.8.3:

TABLE 5.8.3 : Rankings of Growth Mechanisms

Ranking	Growth mechanisms
1	Through internal growth.
2	Through joint venture.
3	Through marketing tieup.

Eight respondents out of 14 considered internal growth as the most effective growth mechanism whereas 4 considered growth through joint venture as an effective means of growth. None of the respondents considered Acquisition or merger as an effective growth mechanism. On the contrary four respondents considered it to be rarely effective in software business. Thus we find that the above rankings substantially supports our hypothesis :

"Internal growth will be a predominant growth mechanism rather than joint venture, acquisition or merger".

5.8.4. Data communication satellite links:

In the questionnaire mailed to software firms , respondents were asked to provide the information pertaining to datacommunication capability they possess. Seven firms have atleast one 64kbps satellite communication link. Mentioned below is the status of data communication link facility and the percentage of off shore sales in their total export sales.

TABLE 5.8.41: Status of Datacommunication satellite link

NOS.OF LINKS	YEAR OF INSTALLATION	Percentage of Off-shore sales in total export sales.		
		90-91	91-92	92-93
1	1992	N.A	N.A	N.A
1	1993	40	50	60
1	1992	15	25	40
1	1992	10	15	30
1	1992	N.A	100	100
2	1992	N.A	N.A	N.A
1	1991	70	70	70

In the above table we can see that the firms which have installed and are using datacommunication satellite link have shown either an increase in off shore percentage of total export sales or the off shore percentage has remained constant(for firms having high percentage of Off shore sales).

TABLE 5.8.42: Percentage of Off-Shore sales in total export sales

for 92-93.

USING DATACOMMUNICATION SATELLITE LINKS	NOT HAVING DATACOMMUNICATION SATELLITE LINKS.
60	28
40	20
30	15
100	15
70	30

On the basis of data mentioned in the above table we can say that firms having datacommunication satellite links have higher percentage of Off Shore sales in total export sales than those without datacommunication link. The average percentage of Off shore sales for firms having datacommunication links is 60% and for firms not having datacommunication links is 21.6%.

Each respondent was asked to prioritise the reasons mentioned for having a datacommunication satellite link. The rank

of the reasons as prioritised by the respondents is as mentioned in table 5.8.43.

TABLE 5.8.43:

RANK	USES OF DATACOMMUNICATION SATELLITE LINK
1	Increasing off-shore software development.
2	Cost reduction.
3	Helps in getting over visa problems.

The preference for use of datacommunication satellite links for increasing off shore software development and the available data supports our hypothesis:

"For firms having and using high speed datacommunication satellite links , the percentage share of Off-Shore sales in total export sales will increase over time".

5.8.5 Focussed Strategy:

To test the preference of generic strategy alternatives respondents were asked to assign the degree of emphasis they give on the various alternatives. On the basis of the responses following ranking is generated for the generic strategy alternatives table 5.8.5

TABLE 5.8.51:Ranking of Generic Strategy alternatives

RANK	GENERIC STRATEGY ALTERNATIVE
1	Focus Strategy.
2	Overall cost leadership.
3	Differentiation of products/services.

Of all the 14 respondents eight gave very high

emphasis and 5 gave emphasis on focus strategy. In case of overall cost leadership 2 firms gave very high emphasis to it. Only one firm gave very high emphasis to differentiation strategy. According to the preferences mentioned in area of focus by the concerned respondents the ranking of these areas are as mentioned in table 5.8.52.

TABLE 5.8.52: Ranking of Focus area

RANKING	FOCUS AREA
1.	Specific application areas.
2.	Specific geographic market segment.
3.	Specific user segment.

Of all the responses received six firms gave a very high emphasis to focussing on application areas while only four firms gave emphasis on specific geographic market segment and three gave moderate emphasis on specific user segment. A very high emphasis on focussing on application areas by firms following a focussed strategy shows that firms normally prefer to focus on certain application areas and develop expertise in this segment of market. Thus above findings substantiate our hypothesis:

"Firms would prefer to focus on a particular application area rather than focussing on specific user segment or specific geographical area".

5.8.6. International Competitors:

In the questionnaire mailed to firms, respondents were asked to name two countries to which their maximum export sales are directed and countries to which their main international competitors belong to. Based on their responses the countries to which they had their maximum export sales directed are:

USA, UK, Germany, Canada, France and Netherlands.

Countries to which their main competitors belong are:
USA, UK, Singapore, India, Ireland, Malaysia, Thailand, New Zealand and Russia.

The profile of the countries which are main customers of Indian software firms shows that they are mainly developed countries having comparatively a very high per capita income as compared to India which shows that lower cost of software professional provides Indian software firms with a competitive advantage in the international market.

We also found that in sample the firms which had a very small or nil percentage of standardised component in export sales have their main competitors from less developed countries like Malaysia, Thailand where labour cost are comparable (reference has been taken of per capita income of a country) with those prevalent in India. This shows that in International market the cost of software services in customised application area(which has maximum percentage of its cost determined by the cost of a programmer) plays a vital role in addition to expertise of a programmer. Firms having high percentage share of standardised package have their main competitors from developed economies like USA , UK etc which signifies the importance of high level of expertise in both computing skills and business skills rather than access to cheap source of programmers. Above inferences substantiate our hypothesis that :

" Firms with high percentage of customised application would compete against firms belonging to less developed countries rather than from the developed countries".

CHAPTER 6

CONCLUSION

The analysis of data indicates that the hypotheses are well supported. We have the sample containing firms which have greater presence in export market than domestic market. Though differences in operational and strategic aspects exist between the responding firms but they are not radically divergent.

Our findings support that Indian Software Industry is an emerging and a fragmented industry with large number of small players. This structure of the industry provides enough opportunities for small entrepreneurs as the setup cost involved are low and at same time market for software products and services is growing at a fast pace with Indian Software Industry showing a growth of 51% in year 1992-93. Presence of large number of very small firms (having number of employees less than 20) in domestic market as compared to firms in export market shows that barriers to entry in domestic market are less than those in export market. Presence of overseas representative offices in many of the firms which responded shows that it is an important requirement for tapping opportunities available in foreign market. It has also been found that government policies and incentives in STP, EOU and EPZ schemes have encouraged entry in to software business as many of the respondents have cited government incentives as important reason for selecting a particular geographical location for software development facility.

Being small in size Indian software firms have constraints over preference of means of promotion. Preference for personal contacts developed over time shows that Indian firms

could have shown a higher growth if they had access to promotion campaigns which produce faster penetration in new opportunities. Also we have found many responding firms having Marketing tieup with overseas information technology firms. The high preference for following a focussed strategy in application areas shows that firms intend to serve a particular segment and achieve expertise in that particular area. We have found many Indian firms in our sample catering to service sectors and have concentrated in application areas like Accounting/ finance,distribution, sales .

The difference in software services composition in Export and Domestic market shows that Indian market for software products and services is still trying to catch with innovations in Information Technology and an average Indian user is less exposed and more ignorant than users in western countries. Even though Indian software firms are small in size, they have long term plans to not only stay but also to acquire expertise to become a global software firm as is seen from their preference to be a global software firm and provide total Information Technology solutions. Also firms have emphasised on Internal Growth as most effective means of achieving growth. This is well justified in an industry where entry barriers are low, market is growing and structure of the industry is fragmented. Joint venture may gain importance in preference for growth mechanism when Industry stops growing at the rate at which it is growing. Use of datacommunication satellite links has gained importance because it helps in increasing off shore sales and provides immunity when changes in visa regulations occur. Our study also shows that there exist an interdependence between the software professional composition (on the basis of their educational background) and the application areas where firm concentrates.

The study has certain limitations. The small sample forbids us to make any generalised conclusion for the Software Industry as a whole.

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APPENDIX

5) Entry in this business was initially meant for (please tick any one)

a) Foreign Market only. _____
 b) Domestic Market only. _____
 c) Both Foreign & Domestic market. _____

INFRASTRUCTURE AND LOCATIONS:

6) Existing Facilities of your company for software development in India and abroad (other than at customer sites)

S.NO	LOCATION	YEAR OF COMMENCEMENT
1.		
2.		
3.		

7) Representative offices in India and Abroad. (other than at customer sites)

S.NO	LOCATION	YEAR OF COMMENCEMENT
1		
2		
3		
4		
5		

8) We have mentioned below some of the reasons that you may have considered for selecting the location of your most recent software development facility in India. Please prioritise the reasons on the basis of their importance.(Assign 1 for most important, 2 for important, 3 for not important, 4 for not relevant). You are welcome to add any further reasons.

REASONS

a) Amiable climatic conditions. _____
 b) Uninterrupted availability of power. _____
 c) Proximity to potential customers. _____
 d) Government subsidies for units under STP,EPZ,EOU schemes. _____
 e) Data communication satellite links. _____
 f) Testing & prototyping facilities for software. _____
 g) Proximity to other software firms. _____
 h) Proximity to your other administrative / software development facility _____
 i) Availability of working space at cheaper rates as compared to market prices. _____
 j) If any other, please specify _____

9) We have mentioned below some of the reasons which might lead to choosing a particular geographical area for an overseas representative office in preference to other overseas location. Please prioritise on the basis of their importance. (Assign 1 for most important, 2 for important, 3 for not important, 4 for not relevant). You are welcome to add any further reasons.

FACTORS

- a) Demand potential of the regional market. _____
- b) Ease of doing business. _____
- c) Low Tax rate in host country. _____
- d) Relaxed norms for repatriation of earnings. _____
- e) Telecomm infrastructure available in host country. _____
- f) Lower cost in maintaining office in host country. _____
- g) Political stability. _____
- h) Host country having cordial relations with India. _____
- i) If any other, please specify _____

10) Do you use High speed data comm satellite links ? YES \ NO
If YES then please give the following information:

- a) Total nos. of Channels used by all your software developing facilities _____
- b) Year of initiating the use of Data comm. link _____

11) Mentioned below are some of the uses of such comm. links for a Software firm. If you are using for purposes other than mentioned ,you are welcome to add same. Please prioritise according to their importance with "1" as the highest priority.

- a) Increasing off shore software development. _____
- b) Helping in getting over Visa problems _____
- c) Cost reduction _____
- d) Reducing the project completion time. _____
- e) If any other , please specify _____

HUMAN RESOURCE :

12). Employee Strength.

YEAR ENDING	TOTAL NOS. OF EMPLOYEES(APPROX.)
1990-91	
1991-92	
1992-93	

SOFTWARE PROFESSIONAL COMPOSITION :

S. NO	EDCATIONAL BACKGROUND	NOS. OF EMPLOYEES (APPROX.)		
		90-91	91-92	92-93
1	COMP. SC./ELECTRONICS ENGG.			
2	OTHER ENGG. DISCIPLINES			
3	MCA			
4	MBA			
5	OTHERS			

13) Mentioned below are some alternative working schedules for software professionals normally followed in Software firms. Please tick the one followed in your organisation.

- a) Mainly fixed working hours.
- b) Entirely Flexitime.
- c) Sometimes fixed and sometimes flexitime.
- d) if any other please specify

FINANCIAL RESULTS :

14). We request you to send us previous three years Financial Statements of your Software Business Unit . If in case these are not available please let us know the following . (Complete anonymity of data will be maintained . The method of analysis will further ensure this. Please give broad estimates where exact figures are unavailable.)

	YEAR ENDING (fig.in lacs)		
	90-91	91-92	92- 93
TOTAL SALES			
SOFTWARE SALES			
SOFTWARE EXPORTS			
GROSS PROFIT(TOTAL)			
GROSS PROFIT(SOFTWARE)			
NET PROFIT (TOTAL)			
NET PROFIT (SOFTWARE)			
EQUITY			
ADVERTISEMENT EXPENSES			
SALARY & WAGES			

OPERATIONAL ASPECT :

15) Please describe organisational structure of your firm.

16) Mentioned below are some alternative working schedules for software professionals normally followed in Software firms. Please tick the one followed in your organisation.

- a) Mainly fixed working hours. _____
- b) Entirely Flexitime. _____
- c) Sometimes fixed and sometimes flexitime. _____
- d) if any other please specify _____

17). Which of the following are Overall Goals of your firm. Please prioritise according to level of importance of each to your firm. (Assign 1 for most important, 2 for important, 3 for fairly important, 4 for not relevant)

- a) Increase Sales. _____
- b) Increase Profit. _____
- c) Cut costs. _____
- d) Increase Profitability. _____
- e) To be a total I T solution firm. _____
- f) To be global software firm _____
- g) If any other, please specify _____

18) Based on your experience in software business how effective do you consider are the following growth mechanisms ? Please assign degree of effectiveness to each of them .(Assign 1 for very effective, 2 for effective, 3 for rarely effective ,4 for not at all effective, 5 for negative effect)

- a) Through internal growth _____
- b) Through Acquisition or Merger. _____
- c) Through joint venture. _____
- d) Through Marketing Tie up _____
- e) Through Technology Tie up _____
- f) If any other please specify _____

19) Mentioned below are some elements of Business strategies that firms normally follow to achieve their goals. On the following elements of Business strategies please assign the degree of emphasis you give in your business unit. Please assign separately for Export and Domestic Market.

(4 for Very high ,3 for high ,2 for moderate ,1 for low, 0 for nil)

	EXPORT	DOMESTIC
a).Overall cost leadership	_____	_____
b).Differentiation of product or service.	_____	_____
c).Focus of the company on		
1) Specific application areas.	_____	_____
2) Specific user segment.	_____	_____
3) Geographic Market segment.	_____	_____
d) Quality leadership .	_____	_____

BUYER'S PROFILE:

20) For financial year 1992-93 the break up of domestic sales

SECTOR

% OF DOMESTIC SALES

- a). GOVT. organisations (e.g defence etc) _____
- b). P S U _____
- c). Private sector _____

21) Please mention Off shore sales and On Site sales as percentage of TOTAL EXPORT SALES for the particular year.

YEAR ENDING	OFF SHORE % (APPROX)	ON SITE % (APPROX)
1990-91		
1991-92		
1992-93		

22) We have mentioned below some of the Industry groups that might constitute possible market segment for the software products developed by your firm. Please tick three most important segments for domestic and export market.

<u>INDUSTRY TYPES</u>	<u>DOMESTIC</u>	<u>EXPORTS</u>
A). MANUFACTURING		
Steel	_____	_____
Automobiles	_____	_____
Textiles	_____	_____
Chemicals	_____	_____
Cement	_____	_____
Telecommunications	_____	_____
Diversified	_____	_____
If any other please mention	_____	_____
B). SERVICES		
Hotel	_____	_____
Transportation	_____	_____
Health care	_____	_____
Banking	_____	_____
Insurance	_____	_____
Software	_____	_____
Consultancy	_____	_____
others, please mention	_____	_____
_____	_____	_____
_____	_____	_____

TIE UP ARRANGEMENTS :

23) Please provide following information regarding Marketing tie up.

S.NO	NAME OF COLLABORATORS	THEIR NATURE OF BUSINESS*	YEAR OF COUNTRY
1			
2			
3			
4			
5			
6			
7			

* For nature of business following index can be used.

1 for trading, 2 for consultancy, 3 for manufacturing,
4 for service, 5 for information technology, 6 for others

24) Please provide following information regarding Technology Tie up. (for nature of collaborators business, please mention according to above mentioned index)

S.NO	NAME OF COLLABORATORS	THEIR NATURE OF BUSINESS*	YEAR OF COUNTRY
1			
2			
3			
4			

25) Product profile distribution for 92-93

SOFTWARE SERVICES	% OF TOTAL DOMESTIC SALES	% OF TOTAL EXPORT SALES.
Customized application	_____	_____
Standardized	_____	_____
Imported software packages	_____	_____
Re-engineering	_____	_____
Data-processing	_____	_____

26) Please rank for domestic and export market separately the following Application areas in terms of their relative share in your firm's total annual sales (92-93). (Assign 1 for area which constitutes largest sales, 2 for the next one and ascending numbers for subsequent decreasing share)

	<u>DOMESTIC Market</u>	<u>EXPORT Market.</u>
a).Finance/ Accounting	_____	_____
b).Manufacturing	_____	_____
c).Communication	_____	_____
d).Marketing/Sales	_____	_____
e).Distribution	_____	_____
f).others	_____	_____

26 a) Normal size (in rupees) of projects executed in last two years.

Export Market Rs. _____

Domestic Market Rs. _____

26 b) Largest project (in rupees) executed since inception of your organisation.

Export Market Rs. _____ Man years _____

Domestic Market Rs. _____ Man years _____

USE OF PLATFORMS:

27) Please mention in decreasing order of the intensity of use in your business.(Put 1 for the most used ,2 for lesser use and ascending nos. for decreasing use.)

	DOMESTIC	EXPORT
a). UNIX	_____	_____
b). DOS/ WINDOWS	_____	_____
c). OS/2	_____	_____
d). RSTS	_____	_____
e). VAX/VMS	_____	_____
f). SOLARIS	_____	_____
g). " C "	_____	_____
h). " C++ "	_____	_____
i). Pascal	_____	_____
j). COBOL	_____	_____
k). DBASE	_____	_____
l). INGRES	_____	_____
m). ORACLE	_____	_____
n). INFORMIX	_____	_____
o). SMALLTALK	_____	_____
p). EIFFEL	_____	_____
q). IBM AS/400	_____	_____
r). IBM MAINFRAME	_____	_____
s). HP/9000	_____	_____
t). VAX 3400	_____	_____
u). UNIX MINIS	_____	_____
v). PC	_____	_____
x).others	_____	_____

28).Which of the following do you find as the most effective means of promotion?

	DOMESTIC	EXPORT
a).Participating in trade fairs.	_____	_____
b).Personal contacts developed with time.	_____	_____
c).Through ESC OR NASSCOM	_____	_____
d).Advertising in World Bussiness Magazines and International News papers	_____	_____
e).Advertising in Indian print media.	_____	_____
f).Sponsorship.	_____	_____
g).If any other, please specify	_____	_____

29). Which new areas of application were tapped (exemplifying innovativeness and creativity) by your software business in last three years?

APPLICATION AREAS	90-91	91-92	92-93
1.			
2.			
3.			
4.			
5.			

30) Is your software firm ISO 9000 certified ? YES/NO (Please tick one of them).

If NO Please mention approximate month and year by which you plan to have (if applicable) ISO 9000 certification.

MONTH _____ YEAR _____

31) Please mention name of two countries whose software firms are your main competitors. Please mention name of countries in descending order with respect to competition faced from their respective software firms.

NAME OF COUNTRY

1. _____
2. _____

32) Please mention name of two countries towards whom your software firm's maximum software export sales are directed. Please mention in decreasing order of their respective share in software export sales.

NAME OF COUNTRY

1. _____
2. _____

33) Please mention any instance of substantial improvement in software development which has lead to substantial improvement in quality of product, reduction in cost, replacing other existing product in related areas.

(THANK YOU FOR COOPERATION.)

Please mail your response to:

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